ARE MICROFORMS DEAD ?

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Abstract: The futuristic slogans like 'paperless society', 'all-digital future', 'marginalisation of print' and 'microfilm technology is dead' of few stalwarts are repeatedly and mindlessly echoed all over. An effort is made here to examine the realities of practical situations to know how far they are true. Some facts and figures are presented to enable practitioners to see it themselves. Examines whether microforms are in use and is there any future for them. Presents three cases of extensive use of microfilm technology with appropriate tables and charts to illustrate how important and how alive the technology is. Highlights suitability of microforms as archival medium and the way they are becoming integral part of digital environment. Enumerates nature and importance of technical reports and the reasons for their production in microform and how they are stored and used. An analysis of use and extensive citation of reports is also presented to break the myth that reports are marginally used and reports in microforms are negligibly used.

Keywords: Microfilm technology; Microforms; Technical reports

1. INTRODUCTION

Of the three media used for storing information, viz., paper, electronic storage and microfilm, the electronic storage is still not widely used and paper has not only become dearer but it may lead to unmanageable size if everything is stored in paper. In other words, it would be a Herculean task for any library to acquire, organise and retrieve all relevant information in paper medium alone. This is how inevitably microforms have entered the fray. Libraries acquire microforms to overcome their budget cuts and inflation, to avoid unlimited extension of library stacks, to maximise acquisition of relevant information with their inelastic budgets, to cut delays in acquiring information and to achieve ease in handling and storage. Microforms were once considered modern, efficient, compact and powerful medium with their own advantages and disadvantages

The main advantages of microforms are: (i) economy, (ii) saving in space, (iii) speedy acquisition (by air), (iv) file integration, (v) easy mechanisation and automation, (vi) low cost on-demand information dissemination and distribution, (vii) easy to archive and have security of information and protection of records, (viii) easy to store, handle and retrieve, and (ix) ecological value and control of paper pollution and cost (Sridhar, 1981).

Acquisition of documents in microforms presupposes development of a micrographics facility in libraries (Sridhar, 1989). In developing micrographics facility, other aspects like organisation, maintenance, quality control and inspection of microforms, relation of

micrographics with other systems of the library, preventive measures regarding the work hazards in micrographics, design of furniture for micrographics, layout for micrographics unit, copyright problems relating to micrographics, etc., have to be addressed. One of the reasons for user resistance, as mentioned repeatedly by experts, is lack of appropriate user aid equipment to read microforms and to take paper copies as and when needed. User equipment facility should also include acid free and fire resisting storing units, micrographics writing/marking pens, handheld viewers, cleaning aid, microform projector, reader-printer/ enlarger printer, automated microform storing-cum-retrieval system, etc.

2. FUTURE OF MICROFORMS

In this information age and IT era, it is often said that microfilm technology is obsolete and microforms are dead. Emerging electronic medium has been so hyped that many believe that microforms are killed and paper is on the way to extinct. It is true that most of manuals, reference books, standards and patents are no more published or brought out in microform. Yet large chunk of gray literature, particularly technical reports and dissertations, are even now produced and economically being acquired by libraries in microform. Incidentally, Web itself is newest chaotic large chunk of gray literature. Holdings of gray literature, particularly technical reports, in some libraries are unusually large. Technical reports are important primary sources of information in the areas like aeronautics, space technology, energy and management. Thus, is it appropriate to call microforms as dead till the existing collection are completely digitised and future production of gray literature are made available in digital form? To answer this question and to understand the realities of the present status and future prospects of microforms let us begin with examination of three current cases.

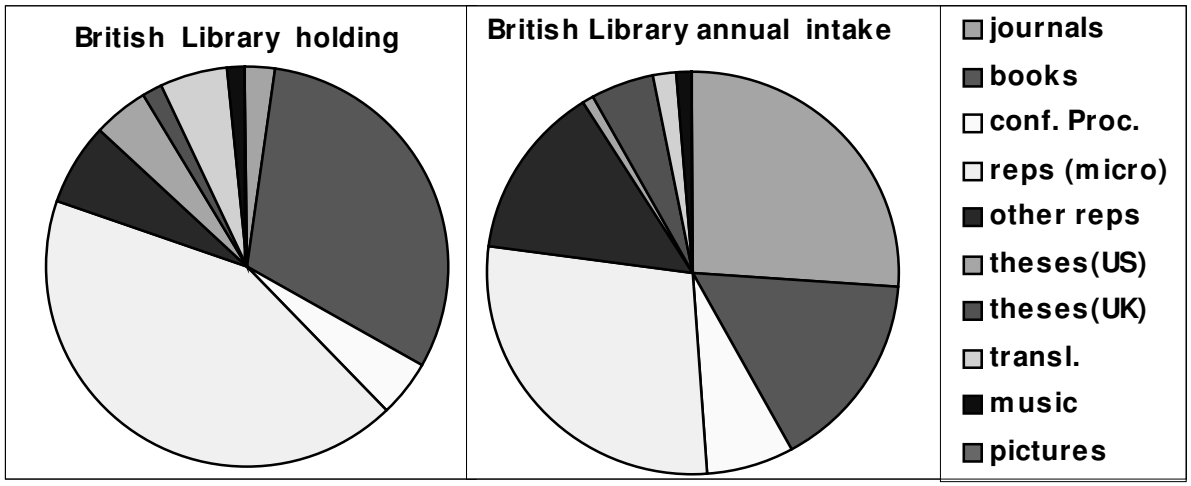
3. THREE CONTEMPORARY CASES

CASE 1. THE BRITISH LIBRARY: The British Library (London), the fifth largest library in the world with over 13 million documents (excluding nearly 50 million patents), is possibly the best and largest document delivery system in the world. Table 1 (with accompanying Charts) depict the holding and annual intake of this wold-popular library. It is quite obvious from the Table that British Library still holds as large a collection of microforms as over 4 million (43%) and even the

TABLE 1: HOLDINGS AND ANNUAL INTAKE OF THE BRITISH LIBRARY

Type of document	holding		annual intake	
	no.	%	no.	%
journals	263,400	3	55,772	26
books	3,211,000	31	33,606	16
conference proceedings	433,800	4	15,000	7
reports in microform	4,440,100	43	59,900	28
other reports	675,000	7	30,000	14
doctoral theses (US)	476,250	5	2,750	1
doctoral theses (UK)	150,400	1	10,425	5
translations	585,000	6	3,750	2
music scores	136,950	1	1,220	1
picture library	10,000	0	300	0
SUB-TOTAL	**10,381,900**		**212,723**	
Patents	47,599,000		1,736,444	
TOTAL	**57,980,900**		**1,949,167**	

annual intake is as high as 60,000 (28%) (The British Library, 2001 *and* The Economist, 2000, p100). Reports in microform outnumber all other type of documents (except patents)



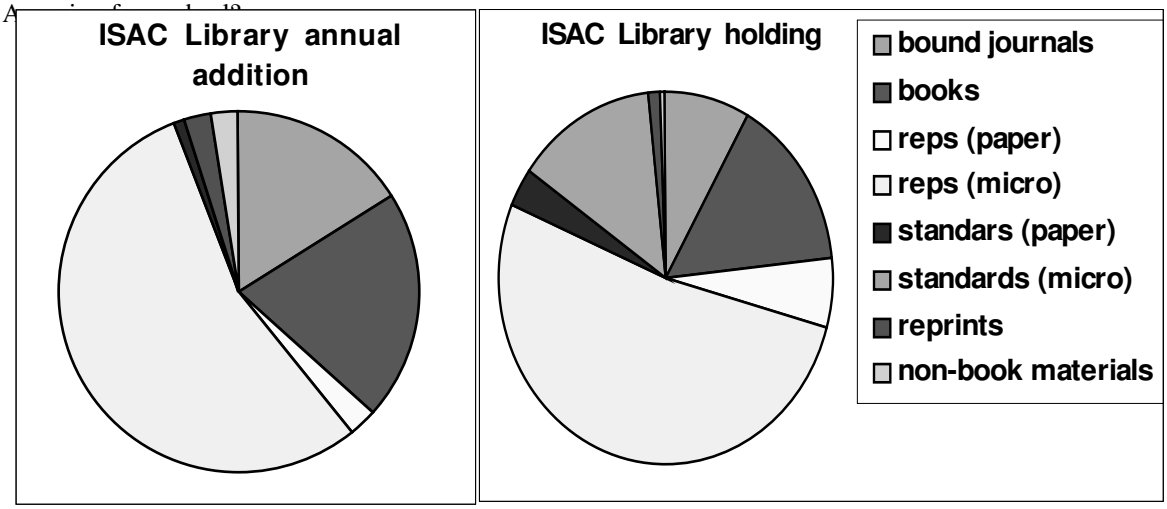
in British Library collection.

CASE 2. PRESERVATON RESOURCES DEPARTMENT OF OCLC: OCLC is the international organisation in the forefront of IT and resource sharing. Preservation Resources Department of OCLC has a state-of-the-art Micrographics Studio (where cameras are claimed to be working 24 hours a day) which has converted 69.5 m pages of old brittle books, newspapers, manuscripts, etc. into microforms in 12 years (Bellinger, 1999, p24). It stores more than 87,000 reels of film equivalent to 5.5 lakh titles for over 100 clients on its on–site custom-built print master storage vaults and reproduces hundreds of reels to meet inter library loan demand (OCLC Newsletter, 2001, p24). The rate of inspection is claimed to be 14 miles of camera master and 25 miles of duplicate film every month (Howard, et. al., 1999, p26).

TABLE 2: HOLDING AND ANNUAL ADDITION OF ISAC LIBRARY

type of document	annual addition		holding	
	No.	(%)	no.	(%)
bound journals	1010	16.3	20400	8.4
books	1260	20.4	36207	14.9
reps (paper)	160	2.5	15061	6.2
reps (micro)	3402	55.0	126732	52.0
standards (paper)	65	1.1	8170	3.3
standards (micro)	0	0.0	32800	13.4
reprints	142	2.3	3076	1.3
non-book materials	147	2.4	1152	0.5
total	**6186**		**243598**	

CASE 3. ISRO SATELLITE CENTRE (ISAC) LIBRARY: ISAC library has a large collection of technical reports in microfiche. Table 2 and accompanying Charts present the holding and annual addition of ISAC Library. Out of its holdings of about 2.4 lakh documents over 1.2 lakh are in microform. Again reports in microform outnumber all other type of documents both under holding as well as under annual addition.



4. MICROFORM IS A SUPIRIOR MEDIUM FOR ARCHIVE

Microform as an archive medium provides a life expectancy up to 500 years. While silver films have an expectancy of 300 years, high-contrast and continuous tone films have 500 years of life expectancy (Howard, 1999, p28). "Despite the revolutionary changes that digital technology is affecting in libraries, microfilm remains the reformatting medium of choice for preservation…" (Bellinger, 1999, p24). Outsourcing market for microfilming is estimated to be as high as $76 billions and "…there is still high demand for microfilming technology. It is an efficient, relatively low-cost solution that can be easily accessed. It is because of microfilm's durability that customers are still choosing it as the most suitable means to achieve documentation" (Davies, 1999. P173).

On the other hand, the digital archive options are affected by (i) developing standards, (ii) variety of institutional practices, (iii) evolving hardware, software, file formats and compression schemes, and (iv) viruses & hacking (need greater security) (Howard, 1999, p29). When media die or change, the resources on these carriers become orphans (Crawford, 1999, p148).

5. MICROFORM IS AN INTEGRAL PART OF DIGITAL ENVIORNMENT AND DIGITAL IMAGING CAN COMPLEMENT MICROFILMING

High speed and high-resolution microfilm scanners, which can be attached and used with any industry-standard applications, are now available. These microfilm scanners have special keyboards and several other microfilm management features. Some of the microfilm scanners on the market are (i) Nanomach ScreenScan 100-DRP model (Pound 3500) which can fit on to existing microfilm readers (ii) Mekel Technology Inc. has desktop dedicated models like M520 (roll film, Pound 26,000) and M560aps (fiche, Pound 40,000) (iii) SunRise Proscan is a production-line scanner (Pound 80,000) (Lee, 2001, p55).

The reverse process of creating microforms from information in digital form is also made simple. Soft wares like CC Data's Alchemy Information Management Software can extract files that are stored electronically and write them to microfilm. The Kodak Document Archive Writer 4800 is used to convert images to microfilm format. Microfilm address and

index criteria are held in Alchemy database. Embedded microfilm retrieval code enables retrieving images from microfilm, scanning them and making them available as electronic image or on paper. With this kind of development, microforms become integral part of digital environment (Information Management and Technology, 2001).

Digital imaging can complement microfilming for better preservation and access. The process of digitisation can adopt the inter-negative approach using the microfilm. In other words, apart from the existing good stock of film surrogates, the process may use microfilm as an intermediary (COM, for example) to digitise a given collection. This approach has the advantages of not only using the existing collection of film surrogates but also incidentally helps meeting the preservation needs (COM), reducing risk of causing damage to the original items and handling oversized and other unusual originals like maps to reach required resolution. Preservation Resources Department of OCLC has even digitised 1.5-m images from research collections preserved on microfilm and microfiche (Bellinger, 1999, p24). They found that a digital surrogate (***not*** replacement) is desirable to prolong the life and broaden the access to archival material.

6. 'MICROFORM DOCUMENTS ARE NEGLIGIBLY USED' IS A MYTH

ISAC Library deliberately buys technical reports in microform by availing advantages like saving substantially on price and storage space. Often microforms are accused of not being well used. Yes, it is true. But on most of the occasions the information which is bought or kept in microform are those supposed to be used rarely or less frequently. This is quite clear as lent out use of paper copy reports themselves are marginal at ISAC library. Table 3 presents data relating to lent out use of books, reports, journals and other documents over one year. Further, it is unlikely that frequently used documents are acquired and kept in microform. Reports in paper form account for just 1% of total circulation use at ISAC Library. Microforms have to be either used in-house with appropriate user aid like reader or print on paper taken from enlarger-printer to be carried by customers. Thus, it is very clear that technical reports even in the paper medium itself are less used.

7. NATURE OF AND NEED FOR TECHNICAL REPORTS

The above fact lead to the question whether technical reports themselves are strongly needed by the user community or not. To ascertain the need for technical reports, one has to understand the nature of technical reports. The rapidly growing report literature is the outcome of certain definite needs of information transfer process. Reports come very handy for communication of internally generated information within an organisation or from contractor to funding agency. Enormous data and information generated in the normal course of work of R & D organisations are presented in the form of reports.

The formal primary communication channels of information are very much choked and cannot effectively accommodate very large quantity of information, often un-edited and unabridged, arising out of high rate of technological advancement and high pressure of large scale R & D. If only adequate formal means of communication existed for scientific

and technical information, reports would not have gained the importance since World War II.

Technical reports are bestowed with many advantages including those of informal communication like rapid and effective transfer of information. Owing to their easy, quick and flexible method of production they have enabled issuing agencies to bring out short run editions. Even bulky reports used to be produced quickly and cheaply in small quantities by simple mimeographing or offset printing. The microfiche has made bringing out short-run editions much simpler. The absence of refereeing, quality control checks, unrestricted form, format and volume have further added greater speed to publication of reports. Reports stand out for their timeliness, speed and for providing most current and up-to-date information. They are normally faster vehicles for dissemination of technical information than other primary media including journal articles.

As reports have flexibility in presentation and production, they often provide exhaustive exposition and full story of research such as experimental procedure, results of tests and observations, review of literature and progress made in field, computer programs developed, bibliographies plus a wide variety of presentations through extensive tables, illustrations and discussions to enable even an engineer unfamiliar with the field to get a thorough knowledge of it. Reports are purposeful publications, concerned with problems and solutions closely linked with the organisation's current or future work and aimed at particular people. Reports are ideal to find out whether some one has faced similar problem in research and if so how did he solve it. Detailed description of the work carried out at each stage including failures, if any, current status of research-in-progress, recent developments in the area given in reports are essential information for engineers wishing to avoid repetition of work or `re-inventing the wheel'.

Reports are normally impersonal emphasising the corporate agency as author, though names of personal authors also appear on them. They are users directed and written for an agency, which has strict control over distribution of reports and has right to acquire and use results contained in them.

Even though many librarians are inclined to accept the view that reports have limited lifetime, selected reports may remain useful for much longer period than others, if the contents have not re-appeared in any other form. Many reports are found totally unsuitable for publishing in a formal media due to their unusual nature and length. However, it is undisputed that currency and utility of reports decrease rapidly when published in a formal media. It is believed that about two-thirds of reports are distributed within two years from the date of inception of the work reported in them.

Further, persons in interdisciplinary and relatively new areas may prefer to communicate through reports for lack of interdisciplinary periodicals and earlier works might have already been dispersed in many periodicals. Reports cover broad range of subjects and hence facilitate interdisciplinary communications.

Unlike pure and basic research where results are often reported through periodical articles, the mission and problem oriented applied research necessarily has to first depend on reports

and pre-prints for immediate communication and libraries have to handle them at least till it is confirmed that reports have reappeared in published form. Even when reappeared, one report rarely leads to exactly one article and often single
article draws information from number of reports.

In nutshell, technical reports are user directed and much more than personal contacts. Reports are often faster, more accommodative than periodicals, more practical and purposeful than conference papers and some important research and development remains only in report form.

Reports having created a new channel of scientific and technical communication pose many problems. Reports are the major let-outs of R & D engineers and technologists who depend heavily on intra-corporate sources of information with less autonomy in choice of projects as against academicians and scientists who not only have wider choice of topics but also communications, both inside and outside the undertaking, and should be given preferential treatment in special libraries. This shadow literature has bibliographic chaos and is subjected to excess bibliographic control leading to overlapping coverage by many secondary periodicals, multiplicity of report numbers, accession numbers and duplication of efforts. On the other hand, classified reports are subjected to negative bibliographic control. Other practical problems include proliferation of report numbers, organisation of internal reports, barriers of security-classification, lack of quality control, content duplication, etc. (Sridhar, 1982, 1983).

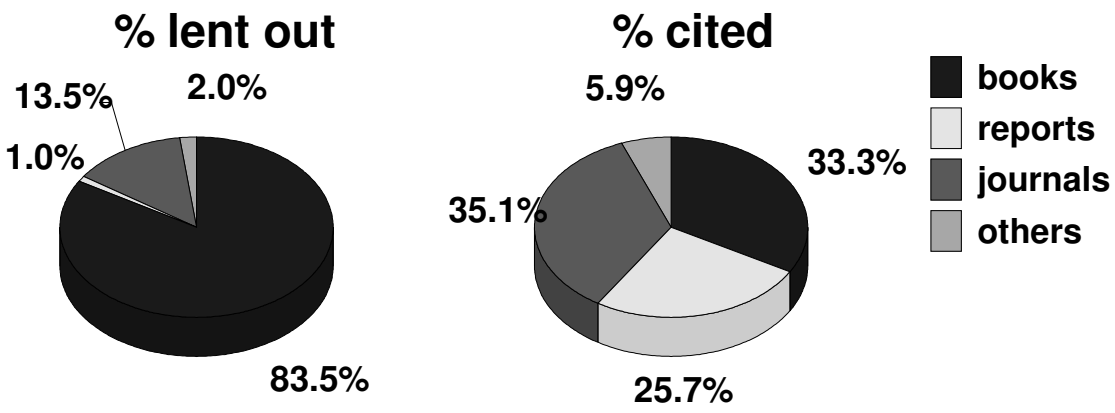
8. LENTOUT USE OF VS. CITATION TO TECHNICAL REPORTS

In order to see how important these technical reports are to space technologists, citation data from all the 114 articles of the space technologies published in 13 issues of ` Journal of Spacecraft Technology' (published by the ISRO Satellite Centre) are extracted and presented in Table 3 juxtaposing with lent-out use of ISAC library documents by the same space technologists. The accompanying pie charts depict the percentages of lent-out use and percentages of citations.

TABLE 3: USE OF vs CITATION TO TECHNICAL REPORTS

Documents	lent out (No.)	lent out (%)	Cited (No.)	Cited (%)
Books	41145	83.5	290	33.3
Reports	493	1	287	25.7
Journals	6615	13.5	217	35.1
Others	988	2	50	5.9
Total	49241	100	844	100

As could be seen from the table and the charts, even though reports account for 1% of lent-out use, citations to reports are as much as 26% in the papers of space technologists. On the contrary, books that account for 83% of circulation use receive just 33% of total citations. It may be noted here that even though, research on correlation between use and citation are not conclusive (Sridhar, 1990, Blecic, 2002), the gross use and citations clearly indicate the importance of technical reports to satellite technologists. Further, a stratified systematic random sample (10%) internal technical reports of recent years verified revealed that as many as 59.4% of their citations (i.e., 389 out of 655 citations in



218 sample reports) are to reports literature. This once again confirms the significance of technical reports to satellite technologists.

Generally, technical reports are expected to provide critical information inputs to space scientists and technologists throughout the world. They are considered to be one of the principal media for primary communication bestowed with several advantages such as user directed nature, ease of handling, speed of dissemination and flexibility in presentation and production. Yet the Indian space technologists have relatively and quantitatively underused the reports at their primary library.

Some of the reasons for marginal quantitative use of reports from the library collection could be as follows. (i) Some reports are available to users directly as gratis from originating sources and authors; (ii) The internal/ Indian reports of the library are otherwise accessible to many users from personal and departmental collections; (iii) Fairly adequate and free reprographic service has enabled many users to possess their own copies of relevant pages or complete reports themselves; (iv) User community is heterogeneous and majority of them by their specialisation and nature of work do not need reports; (v) Lastly, reports normally deal with highly specific and narrow topic and hence they are relevant and useful only to very few users working on the topic (Sridhar, 1984).

Above all, the degree of dependence on a source of information cannot be equated to numerical figures of borrowed use. It is also true that circulation use is a quantitative data and it will neither truly reflect the intensity of need and use nor the ultimate application of information contained in the documents. For example, average time spent in journal section by a typical user is almost double that in book section even though number of users visiting journal section is hardly one-third of those visiting book section. This earlier study concluded that generally less used and less visited materials are more compactly and remotely located causing further reduction on user-visit to those sections and hence obvious reduction in use of such material (Sridhar, 1989).

9. CONCLUSION

Even today microforms have their own advantages over paper and electronic media. General hype of digital world has tried to project an unwarranted negative picture of microfilm technology. The very fact that large part of collections of the British Library and

many special libraries even in India (for example ISAC library) consists of microforms particularly technical reports and other gray literature prove that microforms are very much alive. Libraries which never required and used microforms so far would certainly don't require them in future also and that should not be construed as an indication of extinction of microforms. The 24 hours active Micrographics Studio of Preservation Resources Department of OCLC is yet another testament for utility of the microfilm technology. Thus, microforms are not dead but are alive and have there own place. Unfortunately the exponents of digital world do not perceive this reality. What is urgently required is "people infected with all-digital bug need to be cured" (Crawford, 1999, p175).

It is very surprising that most of the digital library initiatives are starting their digitisation efforts from gray literature (particularly internally generated information) like theses and dissertations despite the fact that theses and dissertations are not well bibliographically controlled and are not as much sought after as the journal articles, conference papers, books and reports. This may be due to easy access and less acute DRM (copyright) problem of theses and dissertations as they are locally generated and often concurrently produced in electronic form by the author. It is also necessary to take note of user acceptance and convenience. Users appear to be not so enthusiastic to use primary sources in e-form (e.g., e-journals) where as secondary sources like databases and reference documents (on CD-ROM or online) are not only quite convenient but also more efficient to search the required information by users and library staff. In other words, the documents requiring searching, browsing and consulting are preferred in e-form than those required to be read continuously. As such the extent of use of e-form for secondary sources is not found to the same extent in case of e-books and e-journals. In case of a special effort made for resource sharing among ISRO libraries, a combination subscriptions like one print and additional copy in e-form which was expected to save almost 80% to libraries could not be implemented as users were not prepared to accept e-journals in place of print versions (Sridhar, 2002). A list of such e-journals available through online access at a marginal additional cost along with selected list of free e-journals worth Rs. 2.37 lakhs and selected list of e-journals available free against print subscriptions worth Rs. 21.50 (for lists see Table 10 and Appendixes I & II in Sridhar, 2002) were circulated among users to consider cancellation of print subscriptions and to depend on free/ complimentary e-journals. The response was not encouraging.

The latest developments have enabled directly digitising the contents of microforms proving the possibility of integrating microforms with digital environment. This possibility together with ideal suitability of microfilm medium for the purpose of archiving is likely to create new economic and efficient ways of information storage, retrieval, access and reproduction as and when required.

Microforms are unnecessarily being criticised as less used material in libraries. The real fact is that this medium has been deliberately chosen for storing less frequently required material. It is also surprising that some people compare the marginal quantitative use of user specific technical reports with that of books or journals and raise an unwarranted question on the need for technical reports. Unfortunately, these marginally used special natured technical reports are naturally produced world over and bought in microfiche in order to achieve enormous saving in acquisition expenditure and storage space. The

number of reports produced in areas like Aeronautics, Space Technology, Energy, Environment, etc., are far more than the number of books or journals produced in the respective areas. As such the number of reports selected even judiciously out of a variety of documents by special libraries is substantially large. The quantitative figures of use of technical reports should not be used to judge their utility to engineers. As demonstrated in these paper reports are well cited by the respective specialists even though they are marginally borrowed from the libraries.

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